General

Guideline Title

ACR Appropriateness Criteria® radiologic management of urinary tract obstruction.

Bibliographic Source(s)

Kolbeck KJ, Ray CE Jr, Lorenz JM, Assimos DG, Burke CT, Darcy MD, Fidelman N, Gervais DA, Hohenwalter EJ, Kapoor BS, Kinney TB, Kouri BE, Nair AV, Rochon PJ, Shaw CM, Expert Panel on Interventional Radiology. ACR Appropriateness CriteriaÂ® radiologic management of urinary tract obstruction. [online publication]. Reston (VA): American College of Radiology (ACR); 2013. 11 p. [86 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Vatakencherry G, Funaki BS, Ray CE Jr, Burke CT, Kinney TB, Kostelic JK, Loesberg A, Lorenz JM, Millward SF, Mohler JL, Nemcek AA Jr, Owens CA, Saad WA, Silberzweig JE, Expert Panel on Interventional Radiology. ACR Appropriateness Criteria® radiologic management of urinary tract obstruction. [online publication]. Reston (VA): American College of Radiology (ACR); 2010. 7 p.

Recommendations

Major Recommendations

ACR Appropriateness Criteria®

Clinical Condition: Radiologic Management of Urinary Tract Obstruction

Variant 1: Adult patient with urinary diversion after remote history of cystectomy for cancer. Patient has no fever. Patient has normal white blood cell (WBC) count and urine output. Loopogram shows no reflux into distal ureters. Computed tomography (CT) scan shows new moderate bilateral hydronephrosis.

Treatment/Procedure	Rating	Comments
Medical management without decompression	3	
Retrograde ureterography	4,5,6	Usually appropriate candidate with benign disease; however, brush biopsy should be performed first to verify benignity. An internal

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

Treatment/Procedure	Rating	Comments
		double J ureteral stent is not recommended because of distal end obstructs.
Percutaneous nephrostomy	7	Brush biopsy should be performed after nephrostomy placement to verify benignity of the stricture. For nonoperable candidates, consider converting to retrograde tube exiting into ostomy.
Percutaneous antegrade ureteral stenting (with or without safety nephrostomy)	6	Double J ureteral stent is likely to be occluded in the ileal loop due to mucus production. Conversion to a retrograde tube exiting the ostomy into the ostomy bag is the standard.
Percutaneous nephrostomy followed by delayed surgery	7	Surgery refers to re-anastomosis, not endoureteral therapies, which have low long-term patency rates. Brush biopsy should first be performed to verify benignity.
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate.		

Variant 2: Adult patient with a 7-day history of right flank pain, fever, and leukocytosis. Urinalysis is positive for blood and infection. Computed tomography (CT) scan shows a 10-mm calculus in the mid right ureter without hydronephrosis.

Treatment/Procedure	Rating	Comments
Medical management without decompression	2	
Retrograde ureteral stenting	8	This should be followed by stone removal when the infection is controlled.
Percutaneous nephrostomy	5	This may be appropriate if retrograde stenting is not possible. This should be followed by stone removal when the infection is controlled.
Percutaneous antegrade ureteral stenting (with or without safety nephrostomy)	2	This involves excessive manipulation for a patient with an active infection.
Percutaneous nephrostomy followed by delayed surgery	5	This may be appropriate if retrograde stenting is not possible. This should be followed by stone removal when the infection is controlled.
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate.		

Variant 3: Adult pregnant (20+ weeks) patient with a 3-day history of left flank pain, fever, and leukocytosis. Urinalysis is positive for infection. Ultrasound scan shows new, moderate left hydronephrosis.

Treatment/Procedure	Rating	Comments
Medical management without decompression	2	
Retrograde ureteral stenting	8	With minimal radiation to the fetus, this is the treatment of choice.
Percutaneous nephrostomy	7	
Percutaneous antegrade ureteral stenting (with or without safety nephrostomy)	2	This involves excessive manipulation in the setting of infection as well as radiation exposure to the fetus.
Percutaneous nephrostomy followed by delayed surgery	1	The cause is likely obstruction related to pregnancy, and the need for delayed surgery is highly unlikely.
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate.		

Variant 4: Adult patient with advanced cervical carcinoma presenting with decreased estimated globular filtration rate <15. Normal white blood

cells, positive pelvic pressure, no flank pain. Computed tomography scan reveals new bilateral hydronephrosis and hydroureter due to local invasion by a pelvic mass.

Treatment/Procedure	Rating	Comments
Medical therapy without decompression	1	
Retrograde ureteral stenting	8	
Percutaneous nephrostomy	8	Consider bilateral nephrostomy.
Percutaneous antegrade ureteral stenting (with or without safety nephrostomy)	8	If able to cross obstruction.
Percutaneous nephrostomy followed by delayed surgery	4	Surgical options are typically limited in this scenario.
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate.		

Variant 5: Adult patient with a prolonged history of right flank pain, fever, and leukocytosis. Urinalysis is positive for blood and infection. Patient appears septic and is hypotensive. Computed tomography (CT) scan shows dilated right ureter and renal pelvis with perinephric stranding. No etiology for ureteral obstruction identified with current imaging.

Treatment/Procedure	Rating	Comments
Medical therapy without decompression	1	
Retrograde ureteral stenting	6	This is appropriate if the patient is coagulopathic.
Percutaneous nephrostomy	8	This procedure needs urgent decompression, which is best achieved with percutaneous nephrostomy rather than retrograde stent.
Percutaneous antegrade ureteral stenting (with or without safety nephrostomy)	2	Minimize manipulation in the setting of sepsis.
Percutaneous nephrostomy followed by delayed surgery	5	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate.		

Variant 6: Adult patient with urinary ascites after recent abdominal surgery. Elevated blood urea nitrogen/creatinine, moderate abdominal pain, and no peritoneal signs. Computed tomography (CT) urogram reveals contrast leak from left pelvic ureteral injury. Current therapy consists of Foley catheter in the bladder.

Treatment/Procedure	Rating	Comments
Medical therapy without decompression	1	
Retrograde ureteral stenting	7	May want to divert with percutaneous nephrostomy first, then attempt to cross injury.
Percutaneous nephrostomy	9	
Percutaneous antegrade ureteral stenting (with or without safety nephrostomy)	8	May want to divert with percutaneous nephrostomy first, then attempt to cross injury.
Percutaneous nephrostomy followed by delayed surgery	7	Use of this procedure depends on the degree of injury.
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate.		

Summary of Literature Review

Introduction/Background

In use for more than 50 years, percutaneous nephrostomy (PCN) catheter placement provides access into the renal collecting system for urinary decompression and, more recently, facilitates endourologic surgery. This procedure was originally performed with limited imaging guidance, and its acceptance was limited initially. Over the ensuing decades, with the improvement in catheters and interventional radiological techniques and the standard use of imaging guidance, the procedure has become increasingly safe. It has been performed with increasing frequency as indications have expanded.

PCN access entails placing a drainage catheter into the renal collecting system and typically uses imaging guidance and the Seldinger needle-wire technique. The placed catheter permits either external urinary decompression (external PCN catheter) or internal drainage through the ureter and bladder by a longer internal ureteral catheter component (percutaneous nephroureteral stent). The following are the most common procedural indications for PCN along with its subsequent success and complication rates.

Urinary Tract Obstruction in the Setting of Infection

In patients who have pyonephrosis (hydronephrosis with infection), urinary tract decompression can be lifesaving. Although drainage can be obtained with retrograde ureteral catheterization, PCN drainage is often preferred for patients who are unstable or have multiple comorbidities. PCN is often performed on an emergent basis. The decision regarding emergent, urgent, or elective PCN placement depends primarily on clinical symptoms of sepsis. However, recent data suggest serum C-reactive protein may be a useful, less subjective parameter.

In the setting of pyonephrosis, PCN is almost always technically successful and often results in marked clinical improvement. PCN can yield important bacteriological information and alter antibiotic treatment regimens by correctly identifying the offending pathogen and improving the sensitivity of bladder urine cultures. In a retrospective analysis, patient survival was 92% when PCN was used, compared with 88% for surgical decompression and 60% for medical therapy without decompression. In addition, hospitalization times were shorter in the nephrostomy group. Postprocedural bacteremia and sepsis are common when infected urinary tracts are drained. Preprocedural antibiotics may not be necessary for patients at low risk for infection. However, when urosepsis is suspected or known to be present, preprocedural antibiotics are recommended.

In neonatal renal candidiasis, fungus balls obstruct the upper urinary tract and predispose to obstructive uropathy and fatal systemic candidiasis. In this setting, PCN drainage allows for both urinary tract decompression and the direct administration of antifungal agents into the renal collecting system. Although the literature in this setting is limited, this technique seems to be valuable in eradicating funguria and is an attractive alternative to surgical decompression.

Obstructing Stone Disease

Acute ureteral obstruction is most commonly related to stone disease and accounts for as many as one-fourth of PCNs performed. In cases of acute ureteral obstruction, extracorporeal shock-wave lithotripsy and retrograde double-J ureteral stenting have been shown to be more successful for complete stone eradication and passage than simple nephrostomy placement. A prospective, randomized, controlled trial of hydronephrosis secondary to stone disease was conducted to compare PCN with retrograde double-J stenting. The technical success rates were 80% for retrograde stenting compared with 100% for PCN. In addition, the dwell time for the PCN tubes was significantly shorter than that for the double-J ureteral stent. Although some ureteral stones will pass spontaneously with a nephrostomy tube in place, many will not. In these scenarios, PCN access can be a conduit for definitive antegrade ureteral stone treatment.

Malignant Urinary Tract Obstruction

Although PCN and nephroureteral stent placement can provide urinary diversion in a variety of obstructing pelvic neoplasms, most of the literature addresses gynecological malignancies, such as cervical cancer, for which ureteral obstruction is a relatively frequent complication.

PCN and/or stent placement will improve renal function in most cases; some investigators have reported improved survival benefits as well as quality of life. However, the patients most likely to benefit from this technique are those who have reasonable treatment options for their malignancy.

In patients with advanced disease for whom only palliative treatment is planned, PCN may offer little benefit, as its performance status and patient survival rates are frequently poor, and further procedures may be necessary. PCN, however, can be used in the palliative treatment of certain patients with advanced disease, particularly in appropriately selected patients who have pelvic malignancies, such as prostate carcinoma and transitional carcinoma.

In patients who have pelvic malignancies, PCN decompression has been shown to be valuable in improving renal function and survival. When

intervention is being considered for patients who have an underlying pelvic malignancy, PCN could have a higher technical success rate in relieving obstruction, compared with retrograde double-J ureteral stenting, especially in cases due to extrinsic compression in the emergent setting.

Urinary Obstruction in the Setting of Pregnancy

Hydronephrosis in pregnancy can often be seen after week 20, as the enlarging uterus compresses the ureter. It is also thought that hormonal changes contribute to this by reducing ureteric peristalsis. However, obstructive uropathy, most commonly due to stones, can occur. Although many small stones pass spontaneously, urinary tract intervention is occasionally necessary. In settings where ureteral catheterization is not technically possible, PCN can safely provide temporary urinary tract decompression, although the data are from small observational series. The incidence of spontaneous abortion or preterm labor related to PCN tube placement is exceedingly low; however, because of the small sample sizes, this issue requires further study.

To limit radiation to the fetus, PCN can sometimes be performed using ultrasound guidance alone, thus obviating the need for radiation. In many cases, however, fluoroscopy will be necessary to safely place the tube. Usually, nephrostomy catheters are left in place until after delivery, and definitive stone intervention is then performed postpartum.

Preoperative and Postoperative Nephrostomy Catheter Placement

Because endourologic approaches replace some conventional open surgical procedures, the indications for PCN and nephroureteral catheter access have expanded to facilitate these procedures. PCN has been shown to be useful in obtaining access for stone interventions, particularly when the stone burden is so large that extracorporeal shock-wave lithotripsy is unlikely to completely fragment and eradicate the stone disease. The ease or complexity of percutaneous stone removal depends on precise nephrostomy access, which occasionally necessitates high intercostal space access with an associated small increase in risk for pleural effusion or pneumothorax development. Similarly, PCN access has been shown to be helpful for endopyelotomy, which affords less morbidity and shorter recovery times than open pyeloplasty for ureteropelvic junction stenoses.

For patients who have pyonephrosis or noninfected obstruction of a nonfunctioning kidney, preoperative PCN could increase the rate of wound infections following nephrectomy.

Ureteral leaks and strictures occasionally occur after both ureteral and nonureteral open surgical procedures. In the setting of such complications, when retrograde ureteral catheterization fails, PCN access, often with nephroureteral stenting, is useful. Use of PCN decompression as the primary management of ureteral injuries results in a decreased need for reoperation and decreased morbidity rates. PCN can provide access for definitive treatment of ureteral strictures and leaks and, thus, obviates the need for repeated surgery. In the acute trauma setting, PCN can act as a bridge to surgery in the treatment of fistulas, urinomas, and urinary ascites.

PCN has been shown to be similarly useful in the management of renal transplant ureteral complications. In cases of post-transplant ureteral leaks, fistulas, strictures, and obstructions, PCN decompression may preserve or improve renal function.

In such settings, nephrostomy access is established when retrograde ureteral access is not possible. In surgical ureteral repair, failure rates are 13% when PCN placement is performed, compared with 87% when it has not been used. Accordingly, PCN is considered very helpful in optimizing transplant patient and renal-unit survival.

Alternatives

The most common alternative to PCN catheter placement is cystoscopic retrograde ureteral decompression with double-J stents. Compared with PCN, retrograde ureteral catheters may be associated with a higher risk of urosepsis in some patients who have an extrinsic ureteral obstruction. PCN may be the preferred option in patients at high risk for anesthesia, or in a setting such as pyonephrosis, when larger tube decompression may be warranted.

Retrograde nephrostomy catheter placement has also been described, but experience with this technique is limited, compared with antegrade nephrostomy placement. Subcutaneous urinary diversion is occasionally used in patients who have malignant obstructions. Open surgical nephrostomy tube placement is rarely used. Interestingly, in a recent opinion survey conducted in the UK, PCN was favored more often by urologists than by radiologists (mean of 69% versus 48%, respectively, for the treatment of uncomplicated obstructive nephropathy).

In the majority of cases a ureteral stent can be placed, either via the bladder or via the kidney, after nephrostomy. In specialty situations, combined procedures with "rendezvous" techniques or even a 1-step antegrade stent placement (without leaving the nephrostomy as a safety measure) can yield similar successful alternative approaches. Standard plastic, as well as newer, metal/reinforced stents, have been used with similar results.

Success and Complications

When performed with imaging guidance, the technical success for PCN placement by experienced operators approaches 100%, as demonstrated

by large UK registry data from over 3,000 PCN procedures. More conservative thresholds have suggested that the technical success of PCN is >95% when using dilated collecting systems and approximately 80% to 90% when using nondilated systems.

The Society of Interventional Radiology quality improvement guidelines (SIR QI) set threshold percentages for technical success rates for PCN at 95% for urinary obstruction without stones as well as renal transplant obstruction. For nondilated collecting systems, SIR QI set the threshold for technical success at 80%, and for complex stone disease including staghorn calculus, it set the minimal threshold at 85%. Although often performed as an inpatient procedure, PCN can be performed safely in selected low-risk patients as an outpatient procedure with same-day discharge. Most operators use ultrasound for initial access and then fluoroscopy to place the nephrostomy tube. Additional imaging modalities have included computed tomography (CT) and magnetic resonance (MR) in special circumstances.

Complication rates related to PCN are low in most series and are usually reported at ≤10%. Recent UK registry data showed an even lower rate of 6.3%, although much higher rates have been reported in patients who have advanced malignancies. The SIR QI guidelines have suggested thresholds for PCN complications, including septic shock at 4%, septic shock in pyonephrosis at 10%, hemorrhage requiring transfusion using PCN alone at 4%, hemorrhage requiring transfusion using percutaneous nephrolithotomy at 15%, vascular injury requiring embolization or nephrectomy at 1%, bowel injury at <1%, pleural complications with PCN (pneumothorax, empyema, or hemothorax) at 1%, and pleural complications from percutaneous nephrolithotomy at 15%.

Adverse events are attributed mostly to catheter displacement, bleeding, and sepsis. Potential risk factors for postprocedural sepsis include diabetes and renal calculi, but these have not been shown to be predictive of postprocedural infection.

Clinically asymptomatic bleeding is a common finding. Mild hematuria is present in approximately 50% of patients after PCN, and CT has shown evidence of retroperitoneal hemorrhage in 13% of patients. Clinically significant bleeding, either into the collecting system or into the retroperitoneum, is less common. Bleeding occurs more commonly in patients who have thrombocytopenia. Persistent bleeding should prompt consideration of arteriographic evaluation for renal artery abnormality, such as pseudoaneurysms, fistulas, or frank extravasation. These vascular injuries can almost always be treated using transcatheter embolization.

Less common complications related to PCN include bowel injury, splenic injury, gallbladder puncture, and pneumothorax. Pneumothorax is more common when an upper-pole calyceal puncture is used, but occasionally such an intercostal approach may be necessary to allow optimal access for stone removal. In uroepithelial neoplasms, tumor growth along the nephrostomy tract has been reported but is believed to be a very uncommon phenomenon. As with any indwelling drainage catheters, PCN tubes are subject to fracture, dislodgement, and occlusion.

Summary

- Management of urinary obstruction varies depending on the obstruction location and local expertise.
- PCN placement is a highly successful procedure that has a relatively low complication rate and permits the relatively quick decompression of urinary obstruction, frequently preserving renal function.
- After decompressing an obstructed kidney, the obstruction is frequently managed on an elective basis, using percutaneous, endourologic, or surgical procedures.

Safety Considerations in Pregnant Patients

Imaging of the pregnant patient can be challenging, particularly with respect to minimizing radiation exposure and risk. For further information and guidance, see the following American College of Radiology (ACR) documents:

- ACR Practice Guideline for Imaging Pregnant or Potentially Pregnant Adolescents and Women with Ionizing Radiation
- ACR-ACOG-AIUM Practice Guideline for the Performance of Obstetrical Ultrasound
- ACR Manual on Contrast Media
- ACR Guidance Document for Safe MR Practices

Clinical Algorithm(s)

Algorithms were not developed from criteria guidelines.

Scope

Disease/Condition(s)

Urinary tract obstruction

Guideline Category

Management

Treatment

Clinical Specialty

Internal Medicine

Obstetrics and Gynecology

Radiology

Surgery

Urology

Intended Users

Health Care Providers

Health Plans

Hospitals

Physicians

Utilization Management

Guideline Objective(s)

To evaluate the appropriateness of radiologic management of urinary tract obstruction

Target Population

Patients with urinary tract obstruction

Interventions and Practices Considered

1. Medical management without decompression
2. Retrograde ureteral stenting
3. Percutaneous nephrostomy (PCN)
4. Percutaneous antegrade ureteral stenting (with or without safety nephrostomy)
5. PCN follow by delayed surgery

Major Outcomes Considered

- Utility of treatment interventions in the management of urinary tract obstruction

- Success rate and complication rate of percutaneous nephrostomy
- Patient survival
- Quality of life

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Literature Search Procedure

Staff will search in PubMed only for peer reviewed medical literature for routine searches. Any article or guideline may be used by the author in the narrative but those materials may have been identified outside of the routine literature search process.

The Medline literature search is based on keywords provided by the topic author. The two general classes of keywords are those related to the condition (e.g., ankle pain, fever) and those that describe the diagnostic or therapeutic intervention of interest (e.g., mammography, MRI).

The search terms and parameters are manipulated to produce the most relevant, current evidence to address the American College of Radiology Appropriateness Criteria (ACR AC) topic being reviewed or developed. Combining the clinical conditions and diagnostic modalities or therapeutic procedures narrows the search to be relevant to the topic. Exploding the term "diagnostic imaging" captures relevant results for diagnostic topics.

The following criteria/limits are used in the searches.

1. Articles that have abstracts available and are concerned with humans.
2. Restrict the search to the year prior to the last topic update or in some cases the author of the topic may specify which year range to use in the search. For new topics, the year range is restricted to the last 10 years unless the topic author provides other instructions.
3. May restrict the search to Adults only or Pediatrics only.
4. Articles consisting of only summaries or case reports are often excluded from final results.

The search strategy may be revised to improve the output as needed.

Number of Source Documents

The total number of source documents identified as the result of the literature search is not known.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Strength of Evidence Key

Category 1 - The conclusions of the study are valid and strongly supported by study design, analysis and results.

Category 2 - The conclusions of the study are likely valid, but study design does not permit certainty.

Category 3 - The conclusions of the study may be valid but the evidence supporting the conclusions is inconclusive or equivocal.

Category 4 - The conclusions of the study may not be valid because the evidence may not be reliable given the study design or analysis.

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The topic author drafts or revises the narrative text summarizing the evidence found in the literature. American College of Radiology (ACR) staff draft an evidence table based on the analysis of the selected literature. These tables rate the strength of the evidence (study quality) for each article included in the narrative text.

The expert panel reviews the narrative text, evidence table, and the supporting literature for each of the topic-variant combinations and assigns an appropriateness rating for each procedure listed in the table. Each individual panel member assigns a rating based on his/her interpretation of the available evidence.

More information about the evidence table development process can be found in the ACR Appropriateness Criteria® Evidence Table Development document (see the "Availability of Companion Documents" field).

Methods Used to Formulate the Recommendations

Expert Consensus (Delphi)

Description of Methods Used to Formulate the Recommendations

Rating Appropriateness

The appropriateness ratings for each of the procedures included in the Appropriateness Criteria topics are determined using a modified Delphi methodology. A series of surveys are conducted to elicit each panelist's expert interpretation of the evidence, based on the available data, regarding the appropriateness of an imaging or therapeutic procedure for a specific clinical scenario. American College of Radiology (ACR) staff distribute surveys to the panelists along with the evidence table and narrative. Each panelist interprets the available evidence and rates each procedure. The surveys are completed by panelists without consulting other panelists. The appropriateness rating scale is an ordinal scale that uses integers from 1 to 9 grouped into three categories: 1, 2, or 3 are in the category "usually not appropriate"; 4, 5, or 6 are in the category "may be appropriate"; and 7, 8, or 9 are in the category "usually appropriate." Each panel member assigns one rating for each procedure for a clinical scenario. The ratings assigned by each panel member are presented in a table displaying the frequency distribution of the ratings without identifying which members provided any particular rating.

If consensus is reached, the median rating is assigned as the panel's final recommendation/rating. Consensus is defined as eighty percent (80%) agreement within a rating category. A maximum of three rounds may be conducted to reach consensus. Consensus among the panel members must be achieved to determine the final rating for each procedure.

If consensus is not reached, the panel is convened by conference call. The strengths and weaknesses of each imaging procedure that has not reached consensus are discussed and a final rating is proposed. If the panelists on the call agree, the rating is proposed as the panel's consensus. The document is circulated to all the panelists to make the final determination. If consensus cannot be reached on the call or when the document is circulated, "No consensus" appears in the rating column and the reasons for this decision are added to the comment sections.

This modified Delphi method enables each panelist to express individual interpretations of the evidence and his or her expert opinion without excessive influence from fellow panelists in a simple, standardized and economical process. A more detailed explanation of the complete process can be found in additional methodology documents found on the ACR Web site (see also the "Availability of Companion Documents" field).

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The recommendations are based on analysis of the current literature and expert panel consensus.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Selection of appropriate radiologic imaging procedures for radiologic management of urinary tract obstruction

Potential Harms

- Complication rates related to percutaneous nephrostomy (PCN) are low in most series and are usually reported at ≤10%. Recent UK registry data showed an even lower rate of 6.3%, although much higher rates have been reported in patients who have advanced malignancies.
- Adverse events are attributed mostly to catheter displacement, bleeding, and sepsis. Potential risk factors for postprocedural sepsis include diabetes and renal calculi, but these have not been shown to be predictive of postprocedural infection.
- Less common complications related to PCN include bowel injury, splenic injury, gallbladder puncture, and pneumothorax.
- Imaging of the pregnant patient can be challenging, particularly with respect to minimizing radiation exposure and risk.

Refer to "Success and Complications" in the "Major Recommendations" field for further discussion of complications associated with PCN.

Qualifying Statements

Qualifying Statements

The American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those examinations generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate

decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Kolbeck KJ, Ray CE Jr, Lorenz JM, Assimos DG, Burke CT, Darcy MD, Fidelman N, Gervais DA, Hohenwalter EJ, Kapoor BS, Kinney TB, Kouri BE, Nair AV, Rochon PJ, Shaw CM, Expert Panel on Interventional Radiology. ACR Appropriateness CriteriaÂ® radiologic management of urinary tract obstruction. [online publication]. Reston (VA): American College of Radiology (ACR); 2013. 11 p. [86 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2010 (revised 2013)

Guideline Developer(s)

American College of Radiology - Medical Specialty Society

Source(s) of Funding

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

Guideline Committee

Committee on Appropriateness Criteria, Expert Panel on Interventional Radiology

Composition of Group That Authored the Guideline

Panel Members: Kenneth J. Kolbeck, MD, PhD (*Principal Author*); Charles E. Ray, Jr, MD, PhD (*Panel Chair*); Jonathan M. Lorenz, MD (*Panel Vice-chair*); Dean G. Assimos, MD; Charles T. Burke, MD; Michael D. Darcy, MD; Nicholas Fidelman, MD; Debra A. Gervais, MD; Eric J. Hohenwalter, MD; Baljendra S. Kapoor, MB, BS; Thomas B. Kinney, MD, PhD; Brian E. Kouri, MD; Ajit V. Nair, MD; Paul J. Rochon, MD; Colette M. Shaw, MB

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Vatakencherry G, Funaki BS, Ray CE Jr, Burke CT, Kinney TB, Kostelic JK, Loesberg A, Lorenz JM, Millward SF, Mohler JL, Nemcek AA Jr, Owens CA, Saad WA, Silberzweig JE, Expert Panel on Interventional Radiology. ACR Appropriateness Criteria® radiologic management of urinary tract obstruction. [online publication]. Reston (VA): American College of Radiology (ACR); 2010. 7 p.

Guideline Availability

Electronic copies: Available from the American College of Radiology (ACR) Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

Availability of Companion Documents

The following are available:

- ACR Appropriateness Criteria®. Overview. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.
- ACR Appropriateness Criteria®. Literature search process. Reston (VA): American College of Radiology; 2013 Apr. 1 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Evidence table development – diagnostic studies. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Evidence table development – therapeutic studies. Reston (VA): American College of Radiology; 2013 Nov. 4 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria® radiologic management of urinary tract obstruction. Evidence table. Reston (VA): American College of Radiology; 2013. 18 p. Electronic copies: Available in PDF from the ACR Web site.

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on December 2, 2010. This NGC summary was updated by ECRI Institute on February 27, 2014.

Copyright Statement

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